TECHNICAL NOTES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

ROOM 101, 1405 SOUTH HARRISON ROAD
EAST LANSING, MICHIGAN 48823

ADMINISTRATIVE MATERIAL - FOR USE ONLY WITHIN THE SOIL CONSERVATION SERVICE

Plant Materials #3 (Rev. 1)

SUBJECT: Release of 'Mackinaw' Birdsfoot Trefoil

DATE: November 20, 1978

TO: All Offices

Robert R. Ditson

FROM: Robert R. Ditson, State Resource Conservationist

Mackinaw birdsfoot trefoil, Lotus corniculatus L. has been released by the Plant Sciences Division of the Soil Conservation Service as an improved variety for use as a long-lived perennial legume with grass for pasture or hay and for use with grass for seeding earth fills, banks and on areas that are too wet for crownvetch. The attractive yellow blossoms enhance its value for critical area plantings where the objective includes beautification. Mackinaw is well adapted to soil and climatic conditions of the upper Midwest.

Origin: Mackinaw, formerly tested as M2-11348 and Mich-240 originated from Empire birdsfoot trefoil plantings in Iowa and is a production of natural selection under Iowa conditions for several generations.

Description: Mackinaw resembles Empire birdsfoot trefoil in general characteristics being a semi-prostate, late blooming pasture type. It differs in being more vigorous in the seedling stage and higher yielding in the mature plant stage.

In row evaluation at the Rose Lake Plant Materials Center, East Lansing, Michigan, it was superior in forage production and stand persistence to New York Empire. Mackinaw has been widely tested in the USDA Uniform Legume Nurseries. Comparisons were made with Empire birdsfoot trefoil at Iowa State University, the University of Illinois and the SCS Plant Materials Center at Elsberry, Missouri. Four years of data from the University of Wisconsin showed the improved variety Mackinaw outyielded Empire when seeded in mixture with bromegrass on both well-drained and poorly-drained sites.

Breeder Seed: Will be maintained by the U.S. Department of Agriculture, Soil Conservation Service, Rose Lake Plant Materials Center, SCS, R. #7, East Lansing, Michigan.

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Management After Estsblishment: Stands of one plant per square foot in pasture and critical area seedings may be considered satisfactory the spring following seeding. If less than one plant per square foot is present and stand is saved for other than seed increase, delay grazing until blooms are evident to encourage seed production. Do **not** overgraze. Clip as often as needed to control weeds. Top-dress with fertilizer according to soil test recommendations. In seed production fields present evidence indicates that severe lodging in birdsfoot trefoil reduces seed yields. When lodging is a problem it may be reduced by planting birdsfoot trefoil in mixture with Kentucky bluegrass or timothy, thereby increasing seed yields.

Seed Availability: Foundation seed of Mackinaw birdsfoot trefoil is available through the plant materials program for the establishment ***of*** a limited number of seed increase plantings for the production of Certified seed.

SCS DOES **NOT** MAKE PESTICIDE RECOMMENDATIONS DIFFERENT **PROM** MICHIGAN STATE UNIVERSITY OR OTHER OFFICIAL PUBLICATIONS. (Pesticides include insecticides, herbicides, fungicides, rodenticides, defoliants, repellents, etc.) WHEN PESTICIDES ARE NEEDED, ALL RECOMMENDATIONS MUST BE IN STRICT ADHERENCE TO, AND CONSISTENT **WITH** REGLSTERED USE, LABEL DIRECTIONS AND PRECAUTIONS -- NO EXCEPTIONS! ANY USE OF A PESTICIDE THAT VARIES IN ANY WAY **FROM** THAT GIVEN **ON** THE LABEL IS A MIS-USE AND IS IN **VIOLATIOM** OF STATE TAW.

Prepared by: Dorian A. Carroll
Plant Materials Special.ist

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MACKINAW BIRDSFOOT TREFOIL (Lotus corniculatus)
For Pasture Plantings
In Indiana, Michigan, Wisconsin

Description: Mackinaw birdsfoot trefoil has been released by the Plant Sciences Division of the Soil Conservation Service as an improved variety for use as a long-lived perennial legume with grass for pasture or hay and for use with grass for seeding earth fills, banks, and on areas that are too wet for crownvetch. The attractive blossoms enhance its value for critical area plantings where the objective includes beautification. Mackinaw is well adapted to soil and climatic conditions of the upper Midwest.

Purpose: To evaluate this variety for pasture. Research data from the University of Wisconsin showed that Mackinaw outyielded Empire when seeded in mixture with bromegrass on both well-drained and poorly-drained sites. Information is needed from field size plantings as to how it performs for pasture use as compared to other varieties of birdsfoot trefoil.

Standard for Comparison: One of the established varieties of birdsfoot trefoil (Empire) will be used as the standard of comparison for Mackinaw birdsfoot trefoil. It should be seeded in a part of the same field at the same time.

Selection of Cooperator: He must be a person in a livestock enterprise interested in better legumes for grazing purposes. He should agree to protect the seeding from grazing during establishment and control grazing on the field after establishment.

Site: Mackinaw birdsfoot trefoil is well suited to the less fertile soils and is productive on somewhat poorly drained soils and soils with slow or very slow permeability. It also has a place on fertile soils to be in permanent cover for long periods of time or in pastures that are difficult to plow or cultivate.

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Planting Method: Kill existing sod! This is important! It can be done by fall plowing flat fields, by spring plowing sloping fields, or by using a field cultivator or heavy disk in both fall and spring. In some instances, chemicals may be used to kill heavy sod. Seeding birdsfoot trefoil after a cultivated crop is another alternative. Place seed in a firm seedbed 1/4 to 1/2 inch deep. At this shallow seeding depth, a very firm seedbed is extremely important. Roll or cultipack before and after seeding, or bandseed with press wheels.

Lime and Fertilizer: Lime and fertilize according to needs shown by soil test. Apply lime and fertilizer before plowing or heavy disking, or if this is not feasible, work in the lime and fertilizer on plowed ground. A pH of 5.8 or better is desirable.

Inoculation: Inoculate seed with fresh birdsfoot trefoil inoculant just before seeding. Use a sticking agent such as milk, sugar and water, or syrup to be sure the inoculant sticks to the seed.

Rate of Seeding: Seed at a rate of 5-6 pounds of birdsfoot trefoil seed per acre. Timothy at 2-4 pounds per acre or bluegrass at 2-4 pounds per acre may be seeded with the birdsfoot trefoil.

Date of Seeding: Plant in early spring. August seedings without a companion crop are sometimes successful, however may be more hazardous if there is insufficient moisture for stand establishment and growth for winter survival.

Management: Clip or graze new seedings closely to reduce weed competition. Pasture off nurse crop, if used, starting when the nurse crop is 6 inches high. Keep livestock off field when the soil is really wet. Allow some birdsfoot trefoil to go to seed the second year. Allow a fall rest period for birdsfoot trefoil to renew root reserves. Graze grass growth off early each spring to reduce competition. Clip weeds on established stands where needed. Use a maintenance application of 300-400 pounds of 0-20-20 or 0-20-10 fertilizer annually. Spread no manure on birdsfoot trefoil fields. Added nitrogen on established stands increases growth on grasses making them more competitive with trefoil.

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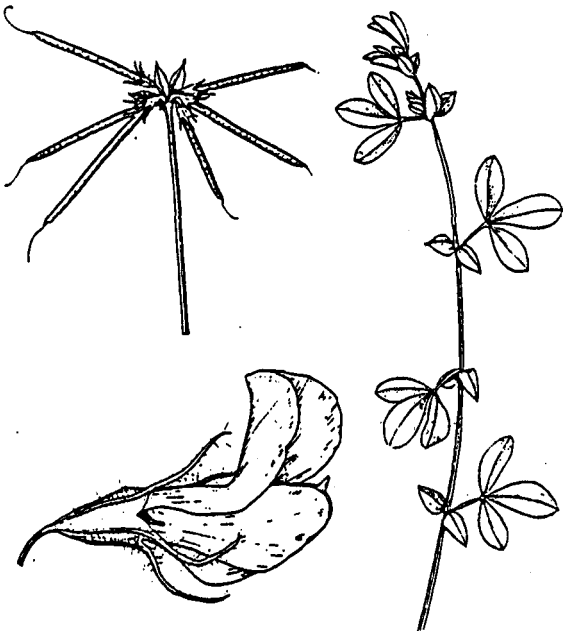
MACKINAW BIRDSFOOT TREFOIL (Lotus corniculatus)
For Seed Production
In Indiana, Michigan, Wisconsin

Description: Mackinaw birdsfoot trefoil (Lotus corniculatus) has been released by the Ecological Sciences Division of the Soil Conservation Service as an improved variety for use as a long-lived perennial legume with grass for pasture or hay and for seeding earth fills, banks, and on areas that are too wet for crownvetch. The attractive blossoms enhance its value for critical area plantings where the objective includes beautification. Mackinaw is well adapted to soil and climatic conditions of the upper Midwest.



Site: Soils should be well drained. A soil that has ample moisture in the spring, but which normally becomes somewhat droughty by early July is preferred for seed production. Avoid weedy fields.

Planting Method: Plow and prepare a firm seedbed suitable for alfalfa or other legume seedings. If the field is weedy, it may be advisable to spray with an appropriate herbicide two weeks prior to plowing. When the seedbed is prepared, apply Eptam at 3 pounds per acre. Follow the directions on the label and incorporate the herbicide into the soil. A meadow seeding is preferred for seed production. Seeding may be done with a drill or by the broadcast method using a cyclone seeder. Cultipack or roll to firm the seedbed before and after seeding, or bandseed with press wheels. Plant ¼ to ½ inch deep. At this shallow planting depth a very firm seedbed is extremely important.

Lime and Fertilizer: Lime and fertilize according to needs shown by soil test. Apply lime and fertilizer before plowing or heavy disking or, if this is not feasible, work in the lime and fertilizer on plowed ground. A pH of 5.8 or better is desirable.

Inoculation: Inoculate seed with fresh birdsfoot trefoil inoculant just before planting, with a slurry of water and peat-based inoculant. Directions and expiration date are given on the inoculant package.

Rate of Seeding: Birdsfoot trefoil has approximately 375,000 seeds per pound. Seed at a rate of 5-6 pounds per acre.

Date of Seeding: Plant in early spring. Early August seedings are sometimes successful, however, may be more hazardous if there is insufficient moisture for stand establishment and growth for winter survival.

Management: Weed growth must be kept to a minimum during seeding year by clipping. After the establishment year, selective herbicides may be used for control of grassy and broadleaved weeds. Be sure to follow manufacturer's recommended rates and times of application and note any restrictions of the Food and Drug Administration and U. S. Department of Agriculture.

Insect Control: Lygus bugs can seriously reduce seed set. Malathion has been used and has given effective control. The first application is at early bud stage and the second, 7 to 10 days later. Follow manufacturer's recommendations. One lygus bug per sweep of a standard "bug net" is considered a damaging population and, during seed set, about 12 bugs per sweep indicates need for control.

Crop Residue Removal and Fertilization: After seed harvest, the crop residue should be removed from the field or shredded back on the land. Follow with application of fertilizer according to soil needs.

Seed Harvesting: Seed normally matures in late July or August. Harvest when most of the seed pods are ripe. Some seed will have shattered at this time. The most effective means of harvest is to cut and windrow the trefoil, then use a self-propelled combine with a pick-up header to separate the seed from the chaff.

Seed Drying: Seed from the combine will be mixed with many leaves and pieces of stems and will heat if bagged without drying.

Seed Cleaning: Cleaning can usually be accomplished with a 2-screen fanning mill using a 1/16" top screen and a 6"x24" bottom screen. If foreign material is still present, run the seed over a velvet roll or (dodder) mill.

CAUTION: Use pesticides only when needed. Handle them with care. Follow the directions. Heed all precautions on the container label. If pesticides are handled or applied improperly or if unused portions are not disposed of safely, they may be injurious to humans, domestic animals, desirable plants, and fish or other wildlife. They may also contaminate water supplies.

NOTE: Trade names are used solely to provide specific information. Mention of a trade name does not constitute a guarantee of the product by the U.S. Department of Agriculture nor does it imply an endorsement by the Department over comparable unnamed products.

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